Science and Mutual Self-Interest

Scientific collaboration in Europe has a long and distinguished history, but political, economic, and cultural barriers remain

Thirty years after the Treaty of Rome, Europe is struggling to forge new links. The following articles examine the achievements, prospects, and problems of European scientific cooperation.

In the past few years, European physicists have been leading the world in the investigation of elementary particles. Research into thermonuclear fusion has been proceeding in Europe along a carefully mapped-out path with a machine that is in some respects more advanced than any in the United States. For a time, at least, the European rocket Ariane was the only launcher in the Western world that was not grounded. And, while their American colleagues were forced to stand on the sidelines, European scientists sent a spacecraft to rendezvous with Halley's Comet. Such are the visible fruits of European scientific cooperation.

Yet, for all the outward signs of success, achieving closer ties between national scientific programs and research groups in Europe is not easy. Cultural, linguistic, and regional diversity, coupled with traditional political and economic rivalries among neighboring nations, all present obstacles to successful cooperation. Indeed, just as the United States and Great Britain are often described as two countries divided by a common language, so Europe can be viewed as a group of nations divided by a common history.

Consider for a moment the problems that would be involved in choosing a site for the Superconducting Super Collider if the ultimate decision were to rest with a committee consisting of the governors of the competing states. Or speculate on the difficulties of establishing a collaborative venture across the cultural and linguistic barriers that divide research groups in the United States and Japan.

Then there are more practical barriers, such as the high cost of airfares in Europe, the lack of equivalence in professional qualifications (French universities, for example, do not award the Ph.D.), and the difficulties of transferring between social security systems, all of which can impede interchange between laboratories.

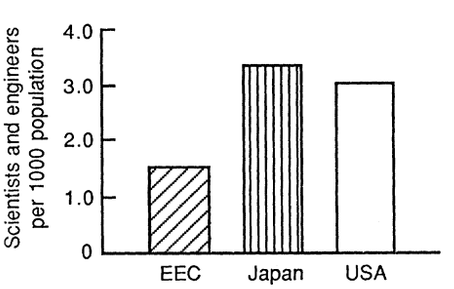
But the incentives for European scientific cooperation are strong. The scientific argument is that Europe is likely to achieve more if it pools its national skills and resources than if these remain fragmented. "The total intellectual talent in Europe is probably level with that of the U.S., but it is split between many countries," says Sir Peter Swinnerton-Dyer, chairman of Britain's University Grants Committee and of the European Economic Community's Committee for the European Development of Science and Technology. "The only way we can put Europe on equal terms with the U.S. is by increased collaboration."

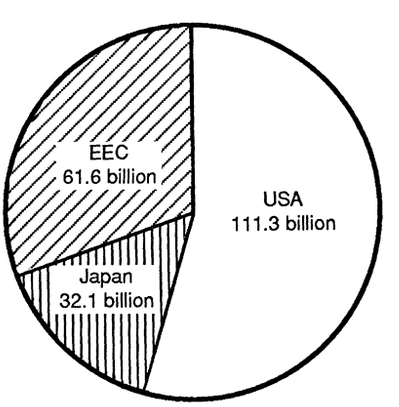
Equally important, scientific cooperation in Europe has a strong political dimension: agreement to cooperate on research projects can help smooth negotiations aimed at cooperation in other fields, such as common telecommunication standards or defense procurement policies. Indeed, one of the original justifications for establishing the European Laboratory for Particle Physics (CERN) in the 1950s was to bring together states that had recently been at war with one another. In practice, successful collaboration has only been achieved when the scientific reasons in favor of a project have been complemented and reinforced by a strong political case.

Until recently, cooperation has been focused on areas of basic research—particle physics, space research, and fusion, for example—where individual European nations would be hard-pressed to afford the necessary facilities. European scientific collaboration has thus traditionally been built around centralized research centers and large projects such as the effort to build Ariane.

Since the beginning of the 1980s, concerns over the economic competitiveness of European industries have stimulated attempts to encourage different forms of cooperation, particularly in technological research likely to have commercial applications. Here achieving a critical mass of scientific talent is seen as the only way of meeting the economic challenge of American and Japanese industry. Such thinking, for example, lies behind a new venture called Eureka, aimed at encouraging cooperation among industrial companies and university research laboratories in many areas of advanced technology.

Reflecting this new emphasis, the EEC has shifted the main focus of its research efforts away from areas such as energy and environmental protection to programs such as ESPRIT (in information technology), BRITE (in basic industrial technologies), and RACE (in telecommunications) that have medium- and long-term industrial applications.





Europe's relative standings. *The United States leads in total dollar spending and Japan in the number of scientists and engineers per 1000 people. [1983 figures from OECD]*

Eleanor Warner

Toward an Academia Europaea?

"The effectiveness of European research would be significantly enhanced if there were a greater sense of community between its scientists," says Stephen Cox, assistant secretary for international affairs at Britain's Royal Society. The notion of a European scientific community, however, has not proved easy to establish.

It is not for want of ideas. The latest is to create a European academy of scientists, somewhat analogous to the National Academy of Sciences in the United States.

A proposal to establish such a body was first put forward by a British science minister at a meeting of the Council of Europe 3 years ago. It failed to catch on at the time, but has now been dusted off and is being enthusiastically pushed by Sir Arnold Burgen, master of Darwin College, Cambridge, and until recently foreign secretary of the Royal Society.

"There is a great richness in European science, and taken all together it is strong, diverse and original," writes Sir Arnold in a background paper setting out his ideas. But, he adds, "Europe lacks an organization for scientists as individuals that might create the cohesion" necessary to overcome the fragmentation caused by "historic boundaries."

The academy—no name has yet been chosen, but in order to minimize linguistic conflicts, a Latin title such as Academia Europaea seems likely—would be financed primarily through private endowments. It might eventually have up to 5000 members, each elected on the grounds of scientific merit. More precise proposals will be worked out at an informal meeting of about 20 European scientists in London later this month.

One of the main purposes, says Sir Arnold, would be "to act as a voice for European science," for example by setting up meetings and study groups on specific themes of concern to the scientific community. He declines to list specific topics, claiming this would be premature; but he says these would be "very similar" to the wide range of questions currently tackled by the Royal Society, which range from risk assessment to the public understanding of science.

There remain several skeptics. French physicist Hubert Curien, former president of the European Science Foundation (ESF), warns that it may not be easy to transplant to other countries the way that the Royal Society operates in Britain—particularly if the idea of an academy is maintained. "In other countries, like France, academies are much more elitist, and tend to have an image of being something of the past," he says.

A potentially thorny problem also exists over the relation of the new organization to ESF itself. The latter was set up in the mid-1970s as a forum for bringing together the various professional scientific academies and government funding agencies of Western Europe, and, at least on paper, shares many of the same goals.

Burgen insists that the two organizations would be complementary. "The kind of model I would like to see is one in which the new academy operates through individual members, like the [National Academy] in the United States, while the ESF carries out the same type of functions as the National Research Council; that is my vision for the future."

The vision is shared by another key figure in the creation of the ESF, Sir Brian Flowers, former rector of Imperial College in London. At present, Sir Brian has said, the foundation—unlike the National Research Council—"speaks without the authoritative sense of independence that only a great academy can confer."

Michael Posner, the ESF's current secretary general, is less dismissive of his own organization's potential, although he admits that it is constrained by the fact that many of its members are government funding agencies. "If we were free to do so—and if our member organizations were happy and relaxed about it—I am confident that we could spread into the area which the new academy intends to occupy, and do it relatively successfully."

Even Posner accepts, however, that "logically, there is a gap" for a European scientific organization that admits individual, rather than institutional, members. He says that, from this point of view, the ESF welcomes the new initiative. "Whether the academy is going to fill the gap is not clear; the proof of the pudding will be in the eating." ■ **D.D.**

"We have had to get the EEC to turn its attention from the problems of the past—agricultural policy, or iron and steel—to the problems of the future," says Michael Poniatowski, a former French Cabinet minister who is now chairman of the energy, technology, and research committee of the European Parliament, the body responsible for authorizing the EEC research budget.

Although there is widespread support for European scientific collaboration, funding remains a major problem. Most European governments have become increasingly reluctant to invest large sums of public money in domestic civilian R&D, and this is reflected at the European level. The EEC Commission's first budget proposals for its Framework Program, for example, were reduced from $12 billion to $8.5 billion, and, finally, $6.4 billion under joint pressure from Britain, France, and Germany. Europe's future space plans are also facing a major cash crisis (see page 1110).

As domestic science budgets in Europe have become hard-pressed for cash, governments are asking whether they are getting value for money from international projects. Scientists in some fields have also come to view such projects as unwelcome competitors for their domestic research budgets.

Funding pressures, coupled with the move toward projects that do not require grandiose facilities, have led to the notion of "networking," the idea that a critical mass can be obtained in a particular discipline not by bringing the scientists physically together in a single institution, but by enhancing the links between existing national research centers.

One of the most effective elements of the EEC's research efforts, for example, has been its so-called Stimulation Program. This provides relatively small amounts of money to enable groups of scientists from different European institutions to work on common research projects, for example by covering airfares and providing occasional support for postgraduate students.

Networking offers three attractions: it is usually more cost-effective than creating or sustaining centers of excellence; it can be used to form bridges between university and industry scientists; and, since every participant institution is directly involved, it obeys the principle of "mutual self-interest" that lies at the heart of successful cooperation.

Thus, even in science, the goal of achieving a United States of Europe is far from being realized. But a federal structure is beginning to emerge that may yet prove to be just as effective, and is certainly more appropriate to the political climate of the late 1980s. ■

DAVID DICKSON AND COLIN NORMAN