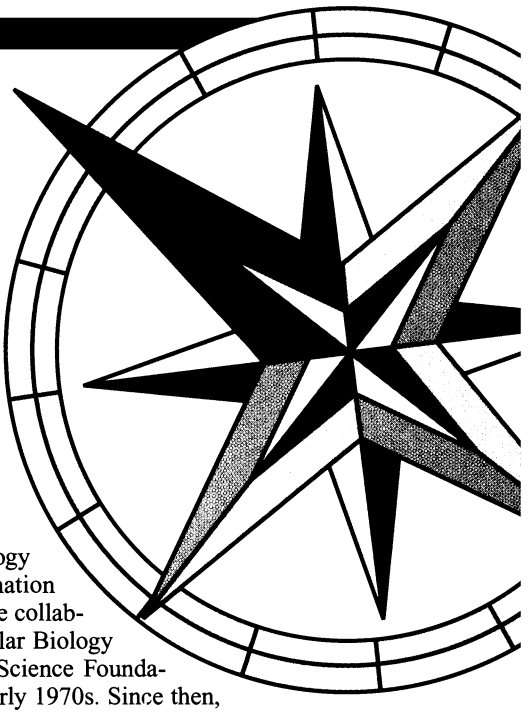

A Europe of Science

Enric Banda

The gross domestic product of the European Union (EU) bloc is roughly equivalent to that of the United States, but the EU invests $60 billion less a year (around 33%) in R&D than does the United States. This disparity exists even in the slightly larger group of countries that soon will make up the EU research system (a total of nearly 30 countries). Part of this differential is due to less investment by European enterprises and part to less public funding of science. To ensure that Europe can remain competitive and participate in burgeoning global scientific collaborations, it is imperative that the EU both increase investment in R&D and renew its collaborative mechanisms.

Looking at Europe as a whole, the administration of science and technology has been a loose conglomerate of individual European countries in combination with that promoted by the European Commission (EC) in Brussels. Most of the collaborative structures in European science [such as CERN, the European Molecular Biology Organization, European Molecular Biology Laboratory (EMBL), European Science Foundation, and European Synchrotron Radiation Facility] were established in the early 1970s. Since then, Europe has developed a single market and a single currency and is working toward a single defense policy and fiscal harmonization, but the organization of science has been trailing behind and is fragmented and, therefore, duplicative—the benefit of joining forces is not being maximized.

Europe needs to move beyond this limited set of mechanisms for coordinating the research effort. The imperatives of increased competitiveness and collaboration must be nurtured at the European level. The ESF Collaborative Research Programmes (EUROCORES) is attempting to do this by bringing together national collaborative research funding in a coordinated manner to address new and important topics. A multinational approach is unavoidable, but it will profit from a common call for proposals and the establishment of a network of funders. The aim of this and other initiatives is to enhance collaboration between countries and their national and international research organizations (as we have seen in the case of EMBL and its associated structures*), lubricated by the EC, as the key for the construction of a true Europe of science.

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In an attempt to address these issues, Commissioner Philippe Busquin, in charge of research in the EC, is promoting the establishment of a European Research Area (see http://europa.eu.int/comm/research/area/com2000-6-en.pdf). The positive reaction to this initiative from ministers for research of EU countries suggests that science in Europe will not be allowed to fall behind. Indeed, a recent debate in Lisbon, hosted by Portuguese Minister Jose Mariano Gago, between the research ministers, Commissioner Busquin, and a number of Nobel laureates and representatives from European scientific (academic and industrial) organizations concluded that despite the present reasonably good health of science in Europe, further support is needed, in terms of both political commitment and increased funding for basic research. Further support has come from the European Council (Heads of Governments) summit in Lisbon in March 2000, which, as well as endorsing the EC's initiative for better integration and coordination of research activities at national and EU levels, also noted that the provision for an EU-wide broadband network, facilitating researcher mobility, and retaining high-quality research talent within Europe are key issues that must be addressed within a short time.

It is clear that whether in Europe, the United States, or any other part of the world, scientists need new and better mechanisms for collaboration.† It is also clear that the mechanisms for international and intercontinental collaboration are not in place. The advent of new technologies in communications, particularly the new broadband capabilities, is making global collaboration increasingly easy, and it seems likely that such collaborations will ultimately become the norm. This requires new ways of conducting research, such as remote control of experiments and interaction with large dispersed databases and models. It also requires new administrative mechanisms that are unbureaucratic, efficient, free of political objectives, and operate between research organizations. The responsibility for developing these mechanisms is firmly on the shoulders of the science administrators and the politicians. The solutions that the EU develops for breaking down its own boundaries to research may help provide a model for the rest of the world.

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*F. C. Kafatos, *Science* **287**, 1401 (2000). †J. Routti, *Science* **287**, 1589 (2000).