Research in Biology: New Pattern of Support Is Developing

London. The pattern of support for biological and medical research is changing in Europe. Scientists in these fields, like their colleagues in nuclear physics, space, and astronomy before them, are successfully lobbying for increased national spending on the life sciences. They are considering a number of international projects. Meanwhile, American research grants abroad are being reduced 50 percent over fiscal years 1963–64, 1964–65, and 1965–66.

As in other fields, European biological researchers want to restore the Old World as the center of science. They want to reduce the pressures that are resulting in a large net migration toward America, to create a genuine European scientific community, to break academic inertia, and to convince governments of the value of supporting science. While they do this, they record their gratitude for American grants which kept research alive immediately after World War II and which have pushed the governments of the richer European countries to emulation. European researchers are also grateful for the large numbers of postdoctoral fellowships which have allowed Europeans to spend two fundamentally important years in the well-financed, gossipy, and democratically organized American scientific community, and which provide European laboratories with large numbers of vigorous young American researchers. The Europeans realize the importance of scientific exchanges between Europe and America, which have become so pervasive as to make scientific nationalism meaningless. Hence, it is without chauvinism that European biologists are seeking a "show of their own."

As they seek additional support, biologists and other scientists in Europe criticize their governments less than they do their colleagues in the universities. They say it has proved very difficult for universities hundreds of years old to adapt their structures to make room for the groups of people with the many different types of training needed in molecular biology; to recognize that some fields are mined out; to provide enough places for postdoctoral fellows; or to advance younger researchers rapidly to professorial positions. Sometimes the complaints are bitter, as in England, where scientists and engineers both protest that intellectuals in nonscientific fields disdain them, or in Italy, where one very prominent researcher has said that a majority of professors are "either rotten or stupid." Scientists in Germany protest against a "Herr Professor Doktor complex." In France, scientists say that some of their university colleagues are waking up to the fact that little research of importance has been done in the universities. Often, it is said, politicians have shown more foresight than the professors. Their support has allowed agencies like the National Committee for Nuclear Energy (CNEN) in Italy, the National Center of Scientific Research (CNRS) in France, the Max Planck Society in Germany, or the Medical Research Council, the Atomic Energy Authority, and the Agricultural Research Council in Britain to provide vital employment for researchers investigating new fields.

The American Paradigm

What the European biological and medical researchers are seeking is something much closer to the American atmosphere, in which money is only part of the reason why new ideas can be tried swiftly. The Europeans know the American story very well, for many key researchers have spent crucial periods in their scientific careers in the United States and maintain such close ties through exchanges of letters, preprints, students, and visits that they can be said to have joined the American scientific community.

One can find many sources of the current stir in Europe, but perhaps the sudden expansion of American scientific budgets since 1959 is the most important.

Besides the example it set, the increase in budgets led to a burst in scientific grants overseas. In fiscal 1959 the National Institutes of Health granted $2,760,135 to individual researchers abroad. In fiscal 1963, the peak year, NIH granted $13,590,209, not including grants to international organizations and funds spent through money. In fiscal 1963 NIH had 414 grantees in Europe who were spending a total of nearly $6 million.

In some European countries NIH money constituted a significant fraction of the flexible grant funds. In Britain the total rose from $389,082 in fiscal 1959 to $1.7 million in 1963. This sum, divided among 108 grantees, was only a little less than the $2 million spent by the British Medical Research Council (MRC) on individual grants to researchers outside its own 85-odd laboratories and research groups. NIH grants came equally close to MRC grants in 1961 and 1962. In Sweden, 75 NIH grantees received a total of $1.5 million in fiscal 1963, more than the Swedish Medical Research Council spent for grants.

Spending by the military agencies on nonclassified work in Europe did not rise as dramatically as NIH's outlay, but the U.S. Air Force had outstanding at the end of fiscal 1962 grants and contracts for which the annual spending level was $5,552,600. Of this sum, close to $900,000 was for biological and medical research. U.S. Army contracts in Europe at the

The author, Victor K. McElheny, is European correspondent for *Science*. He will report frequently on important scientific installations and developments. Mr. McElheny has been a science news reporter for the Charlotte *Observer*, a Nieman fellow at Harvard, and recently was associated with the Swedish American News Bureau in Stockholm. His address is Flat 3, 18 Kensington Court Place, London W.8, England. Telephone: Western 5360. Reprints can be obtained from Mr. McElheny at the London address and also from *Science* editorial offices.

same time totaled $2.2 million, Navy contracts, $1.2 million.

Fiscal 1963 was the high-water mark of the overseas grants. Starting with fiscal 1964, the cuts began, technically as the result of a U.S. Bureau of the Budget order aimed at saving dollar losses which affect the American balance of payments. There was much more behind the cuts then than the balance of payments, however. Over the years, American government agencies developed a more explicit policy toward assisting science abroad.

An element in the process was the elaboration of scientific advisory machinery in the State Department. Starting in 1959, it posted science attachés in many capitals. The science adviser became head of a bureau. The science adviser and attachés became aware of the political significance the grants were assuming. They noticed the size of the medical grants in Sweden. They noticed the potential trouble from military grants in Japan during the agitations of 1960 and the discontent of both the Israeli and the Indian governments as American grants pulled able men off significant problems of applied research into basic studies.

In Congress and private foundations people began to feel that grants should be diverted from developed countries which can pay for their own research into less developed countries. Although NIH refused to regard its grant program as an aid program, as a result of new legislation it set up research programs in countries such as Egypt, using counterpart funds from the sale of agricultural commodities. Attempts were made to step up assistance to science in Latin America through the Alliance for Progress. The Ford and Rockefeller foundations shifted most of their attention to Asia, Africa, and Latin America; new grant money flowed to the International Rice Research Institute near Manila, and the grants which had sustained the Institute of Genetics in Lund, Sweden, for many years were ended in 1963.

In 1962 a panel of the President's Science Advisory Committee considered assistance to science in developed and underdeveloped countries and concluded that some of the assistance which had developed out of specific agency missions might even run counter to the broad interests of the United States.

Roger Revelle, who was then science adviser to the Secretary of the Interior, has obliquely described some of the panel's reasoning, in *Cultural Affairs and Foreign Relations* (1963, p. 135). This is what the panel thought about European grants.

> In the early days of United States support in Europe, our programs were an important factor in many countries in increasing their awareness of the values and usefulness of science, thereby increasing the level of domestic support provided for research. In some countries our support helped to keep good scientists productive, and prevented frustration during a period when the local government was unable to provide full support itself. Our assistance encouraged scientists to remain in their native lands, rather than migrate to the United States or elsewhere in the hope of finding support for their work. Scientists working on United States grants or contracts were able to visit the United States and thereby to increase face-to-face scientific communication. American support helped to identify and support promising younger scientists, and enable outstanding university teachers to take responsibility for more graduate students. These programs demonstrated that governments can support science across national borders effectively, and, to a measure, disinterestedly for the good of all men and nations. The patterns thus begun may prove to be of great and lasting value.
>
> As a result of the rapidly advancing European economic situation, some of these programs may now be working against full assumption of responsibility for research support by local governments. Our objectives should lead us in a different direction—to emphasis on cooperative research.

The panel gave as an example of cooperative programs the work of the National Aeronautics and Space Administration, which recently signed an agreement to launch satellites for the European Space Research Organization, as it has launched them, or plans to do so, for Britain, France, Italy, and Canada.

Last winter, C. V. Kidd, director of NIH's Office of International Programs, toured Europe to explain the policy of cutbacks. He met with government officials and addressed a seminar on science and public policy held in Stockholm by the Academy of Engineering Sciences. The reaction to Kidd's visit was generally very friendly. The scientists and administrators he met told him they were grateful for crucial past support but confident their governments would take over most of the grants. Their confidence was based on sharply rising government expenditure on biological and medical research.

In 1959 the biology grant program of the British Department of Scientific and Industrial Research spent only $560,000. In 1963 the total was $2,650,000. The Medical Research Council's own extramural grant budget rose from about $1.4 million in fiscal 1960–1961 to $2.4 million in the current fiscal year, 1964–65. MRC's total expenditure, which pays for such institutions as the Laboratory of Molecular Biology in Cambridge, the Chester Beatty cancer research center in London, and the National Institute of Medical Research in Mill Hill, has doubled since 1958, to a total of about $20 million.

In Sweden, the response to the plan of reductions in American grants was swift. The Medical Research Council's budget for grants rose from $1.7 million in 1963–64 to $2.4 million in 1964–65.

In the French Fifth Republic, a scientific coordinating agency called the Délégation Générale has been created. The Délégation administers a development fund, set up in 1961, which is used for various "actions concertées" in fields in which the French Government feels special action is required. Many of these fields are areas of applied research (electronics, theoretical problems of computers, automation and regulation, problems of planning), but others concern basic research. Over 5 years, $5.1 million was allotted for cancer and leukemia studies, $8.2 million for molecular biology.

The budgets of the National Institute of Hygiene (INH) and the CNRS, which has many biological laboratories (including a celebrated group of Gif-sur-Yvette, near Paris), have risen sharply in recent years. In answer to criticisms made by a Communist deputy, Gaston Palewski, on 19 June, the French minister for science said the CNRS budget had increased by a factor of 3 from 1952 to 1964, INH's budget by a factor of 8.

André Marechal, head of the Délégation Générale, told a meeting in London on 3 March that the number of CNRS researchers had increased from 2665 in 1955 to 3773 in 1962. The CNRS budget was $60 million in 1962. The INH budget had risen from $650,000 in 1958 to over $5 million in 1963. The budget of the National Institute of Agricultural Research had risen from $4 million in 1959 to $12 million in 1963.

The result of expansions of this order has been a radical improvement in laboratory equipment. Professor Marianne Grunberg-Manago of the In-

stitut de Biologie Physico-Chimique in Paris, one of the beneficiaries of the "action concertée" in molecular biology, takes visitors to look at remodeled laboratories crammed with new equipment. She says that there has been a "dramatic improvement" in the last 5 years. Georges Cohen of the CNRS biology laboratories in Gif-sur-Yvette says that much of the equipment shortage has been solved. "Now if something is wrong," he remarks, "we know it is with *us*."

Grants to science in Western Germany have been mounting fast, but not fast enough to raise the federal republic's per capita expenditure on science to much more than half that of the United States or Great Britain. But the total income of the Max Planck Society (which maintains about 1000 scientists in 41 institutions) rose from $1 million in 1961 to over $30 million in 1963. Something like $50 million has been made available for university construction over the next 10 years, and several new universities are planned.

Democracy and Expansion in German University Structure

Notable in the expansion of the Max Planck Society and of German universities are several attempts to democratize the organization of research and teaching. Most talked of is the recent success of Rudolf Mossbauer of the California Institute of Technology in persuading the Technical University of Munich to create a collegial physics department with 16 professorial positions. Mossbauer will hold one of them but will also spend several months a year in the United States. The new Munich physics department is a decisive departure from the old German institute, dominated by a single professor. Although this change has received much publicity and aroused much anger, the University of Freiburg has quietly made similar changes in many departments in recent years. The University of Köln, likewise, has recently taken a step in the same direction. There, a new department of genetics has been created under the leadership of Max Delbrück, Carsten Bresch, and Walter Harm. The department has operated informally as a collegial department on the American model. In July the faculty gave its consent to establishment of a department with five professors, each of whom would serve a 1-year term as chairman.

The Max-Planck-Institut für Virusforschung in Tübingen has been rotating the duties of director among the heads of its four sections—Hans Friedrich-Freksa, Gerhard Schramm, Alfred Gierer, and Werner Schäer. Each man heads a fairly small section, rather than a large institute, as was once common practice in the Max Planck Society. The arrangement has worked well enough for the Tübingen system to be chosen as the model for a new institute of molecular genetics, which will be formed in Berlin under H. G. Wittmann, in place of an older genetics institute headed briefly by Fritz Kaudewitz, now at the University of Munich. The molecular genetics institute will have small sections like those of Tübingen. One of these will be headed by a guest researcher, who will have money and space enough to bring his whole team with him for a year or two. The first head of the guest section will be Gunther S. Stent, professor of virology at the University of California, Berkeley.

The scientists hope to do more than strengthen national support for biological sciences. They wish to create the same communication among European scientists that they see between Europeans and Americans, or between laboratories widely scattered over the American continent. They also seek ways of recreating in Europe the large assemblages of biological scientists that can be found, say, in Boston. They hope that international funds, free of local scientific politics, may be established, for making grants to promising researchers and for fellowships, travel, seminars, and working groups. International laboratories, too, might be desirable. But in what form? Several different projects, all of which might forward European collaboration in the biological sciences, have cropped up in the past 2 years. Which of the plans will survive is not yet clear.

A World Health Research Center

Although the World Health Organization has been chiefly concerned with infectious diseases in underdeveloped regions, its staff has recently worked out a proposal for a world health research center that would be located somewhere in Europe. Edinburgh has been mentioned as the site.

In 1962 a committee of 31 scientist-consultants and Martin Kaplan, special assistant for research problems to WHO director-general M. G. Candau, worked out details. According to Kaplan, Candau ordered the study because he recognized "the inadequacy of present efforts and the need for effective approaches to urgent and long-range problems affecting global health that cannot be attacked effectively at national levels."

The committee's list of problems not being handled effectively by single nations included the following [see R. Calder, *New Scientist* (16 Jan. 1964)]: "the great potential effects of chemical contamination of air, water and foodstuffs on whole populations; the possible ill-effects of new medical and biological products given to or injected into millions of people each year throughout the world; the special medical problems of the new nations; the need to improve communications on matters of health and medical research; the better use of mathematics, physics, chemistry and engineering for the studies of communicable and non-communicable diseases; and the combination of all these disciplines with those of biology and social science for improved health planning at national and international levels."

According to science reporter Howard Simons of the Washington *Post* [*New Scientist* (4 June 1964)], the consultants proposed three divisions for the center: a division of epidemiology for studies of the variation of incidence of disease; a division for health communications; and a division for biomedical research on such topics as environmental pollution, cancer, heart disease, chronic diseases of the aged, mental health, and special problems of developing nations.

Calder, a professor at the University of Edinburgh and a strong backer of the center, asserted that the center's research program "was carefully defined so that there would be no duplicating or overlapping with what is being done or could be done by other institutions or national research laboratories."

The possibility is not excluded that such a WHO center might include a proposed European laboratory of molecular biology, which has been considered since early 1963 by a group of leaders in the field. For this reason Kaplan has maintained close liaison with the molecular biology group and has sat in on some of its meetings.

The WHO staff estimated that the buildings and equipment of the center would cost about $43 million. The host country would be expected to donate the site. At the end of 5 years the

staff would include over 300 senior scientists, over 500 junior scientists, and more than 400 technicians. The budget for the first 10 years of operation would be about $260 million. In imitation of the policy of the European Nuclear Research Center (CERN) in Geneva, WHO planned only short-term appointments for most of the staff. CERN makes short-term appointments to keep up a steady flow of researchers between national laboratories and CERN, and to help maintain an adequate supply of physics instructors in member nations.

A "Grandiose Misconception" Elicits Heated Debate

The proposal for the WHO center was discussed by WHO's board in January and passed along to the WHO general assembly in March. The idea suffered a sharp setback. The delegates voted to send the proposal back to the WHO secretariat for more work. The United States showed little enthusiasm for the medical research portion of the project at Geneva, although President Kennedy had spoken to the United Nations in favor of the health communications center and former presidential science adviser Jerome Wiesner had shown interest in the proposals at earlier stages.

Britain had rejected the proposal, although favoring more study of it. Rejection had been counseled by the Advisory Council on Scientific Policy, the group of scientists which advise Quintin Hogg, minister for education and science, on request. Some of the British reasoning was made clear in late June and early July, when newspaper printed reports that Edinburgh would have been the site of the center.

Sir Harold Himsworth, secretary of the Medical Research Council and a member of the advisory council, said at a news conference on 14 July that the proposals for setting up divisions of comparative epidemiology and health communications were "admirable," but that the idea of the biomedical division was not.

"Advice was widely taken," Himsworth told reporters, "and all of it was critical." Would the biomedical research laboratory advance knowledge? No, said Himsworth, it would take scarce talent away from national laboratories. There was no clear demand for giant biological groups like the giant groups of nuclear physics, where researchers must work together with large machines. Because nuclear physics has been developing for 50 years, there is plenty of extra talent for a center like CERN. But the new fundamental biological studies are just beginning, Himsworth asserted, and the most important use for scarce talent is to create departments of molecular biology in British universities, "to bring on the next generation."

Articles in the *British Medical Journal, Health*, and *Lancet* all opposed the biomedical division plan. Neville Goodman, chairman of the United Kingdom committee for WHO, wrote in *Health* that the plan was vast and that he wondered if it could perform better than the many national research centers. The editor of *Health* called the plan a "grandiose misconception." The *British Medical Journal* said that a research agency with a budget of $26 million a year was too big for WHO. It doubted if the center could attract good researchers. *Lancet* asserted that large groups devoted solely to basic studies for long periods are unproductive.

Partisans of the idea asked questions in Parliament. The *New Scientist* (2 July) said in a leading editorial: "There is an opportunity for an international center to which many nations can contribute and from which they can benefit. The WHO is the obvious body to organize it and to argue that research work should not be a concern of the WHO is simply obscurantist. The work is urgently necessary. To consider only one aspect, what national leader can stand up and say that his country is doing all that needs to be done by way of research on contamination of the environment by toxic and mutagenic chemicals?"

Other Proposals, Other Controversies

The WHO plan is not the only proposal to excite controversy. Although there has been little publicity about it, backers of the proposed International Biological Program are having a very hard time agreeing on which fields of biology have developed to the point where fixed international observation efforts are justified, despite the fact that a special committee for the program (like that of IGY) was created at a meeting in Paris in late July. Less controversial is the International Cell Research Organization created under the auspices of UNESCO.

As much up in the air as the WHO center is the French proposal that 0.5 percent of military budgets should be diverted to a "general world mobilization against cancer." This idea apparently has its origin in the death from cancer of the wife of Yves Poggioli, a reporter for the French newspaper *Nice-Matin*. Reacting to an editorial on disarmament in the French left-wing journal *Liberation*, Poggioli wrote the editor, Emanuel d'Astier de la Vigerie, an impassioned letter urging that d'Astier drop abstract questions and attack the immediate horror of cancer. D'Astier, a World War II comrade of President Charles de Gaulle, took the idea up with the French leader at the Elysée Palace on 22 June 1963. De Gaulle favored it, and D'Astier got people like the writer François Mauriac to sign a petition which went to de Gaulle last November. The petition drew especially sympathetic attention from de Gaulle because his personal physician had recently died of cancer. At de Gaulle's direction, the United States, the U.S.S.R., Britain, Italy, and West Germany were invited to send delegates to an assembly in Paris to discuss the idea. The U.S.S.R. declined, on the ground that France ought first to make another disarmament gesture—signing the Moscow test-ban treaty.

Sir Joseph Godber of Britain's ministry of health and James Watt, director of the U.S. Public Health Service's office of international affairs, attended the first meeting in Paris, in December. The delegates found themselves adopting a much less grand vision of the proposed war on cancer. It was felt that many individual nations had already established cancer research institutes and that the state of research on the subject, migrating as it was toward fundamental biology, did not demand an international assemblage of researchers. Without objection from France, the delegates decided that the project should be turned over to the World Health Organization in order to remove political overtones.

At a second meeting, on 27 and 28 February, the American delegates had a good deal to say [*Le Monde* (16 June 1964), p. 1]. Cancer research, they said, was well supported in the United States, but not in Europe. Europe should play a leading role in coordinating and stimulating cancer research. Forming an organization closely linked to WHO would be a decisive step in such European cooperation and would lead ultimately to true partnership between equal research efforts. The Americans urged that the idea of contributions amounting to 0.5 percent

of military budgets be dropped. The American contribution would amount to $250 million a year, far more than the budget of the National Cancer Institute. Instead, the Americans urged, the WHO cancer center should be supported by fixed extra contributions from nations which chose to join.

Europe's War on Cancer

This plan was approved for submission to the various governments. It was also agreed that the center should limit itself to such functions as exchange of information, education of researchers, and organization of research programs concerning, or technical supply centers for, cell cultures, complex apparatus, and laboratory animals of precise ancestry.

At the February meeting the French Government announced a contribution of $200,000 from its defense budget to get the project started. In April the British foreign office announced a $400,000 contribution.

On 19 March the general assembly of WHO approved the taking over of the cancer project and U.S. Surgeon General Luther Terry announced warm support. But since then little has been done. A third meeting for detailed planning, scheduled for June, was called off. *Le Monde* wondered out loud if the reason for delay wasn't a feeling in Congress that grants to Europe should be cut down, and that Europe should start "flying with her own wings."

EMBO

Attempting to do just that is the embryo European Molecular Biology Organization (EMBO), which is a kind of union of 160 researchers in Europe and Israel [*Science* **144**, 398 (1963)]. The organization is now considering two plans: an international plan for financing research, fellowships, travel, and seminars, and an international laboratory with a staff of about 20 permanent researchers and 130 short-term researchers and postdoctoral fellows, costing between $2 million and $3 million a year.

Plans for EMBO were discussed in preliminary meetings in Geneva on 28 March and 28 June 1963, attended by the late Leo Szilard and by Victor F. Weisskopf, director-general of CERN. After a longer meeting at Ravello, near Naples, in September 1963, molecular biologists met in Geneva on 2 February and announced the establishment of EMBO. Its council includes the following: Jean Brachet of Brussels, Adolf Butenandt of Munich, Adriano Buzzati-Traverso of Naples, Arne Engström of Stockholm, Hans Friedrich-Freksa of Tübingen, François Jacob of Paris, Ephraim Katchalski of Rehovot, Edouard Kellenberger of Geneva, John C. Kendrew of Cambridge, A. M. Liquori of Naples, Ole Maaløe of Copenhagen, Max Perutz of Cambridge (chairman), Charles Sadron of Strasbourg, Arne Tiselius of Stockholm, and J. Wyman of Rome.

The fund appears headed for some success. Several important European foundations have shown interest. Among the early goals are replacement of the $1.2 million which NIH now grants to molecular biologists in Europe and Israel and about $500,000 for travel, discussions, and about 90 fellowships.

In considering the idea of an international laboratory, the molecular biologists find an emotional similarity with CERN, since they, too, are looking for "a show of their own." But instead of having a great machine as a centerpiece, the molecular biology laboratory would assemble a "critical mass" of people with command of very different techniques and talents, the kind of assembly molecular biology appears to demand. Such groups as the 50 scientists of the Molecular Biology Laboratory in Cambridge and the workers around Sir John Randall in London or at the Institut Pasteur in Paris are concerned with only about a third of the subjects covered by the definition of molecular biology. Almost any European country could pay for the laboratory, but none of them could supply all the people needed, even by stripping their existing laboratories. Such a laboratory could attract some major European researchers back from America for permanent positions, open new posts to promising younger researchers who would otherwise migrate to America, make a significant increase in the number of European postdoctoral fellowships in molecular biology, and, if CERN's history is repeated, stimulate universities to set up posts and departments for molecular biologists. If the number of permanent positions were kept small, it is felt that the drain on existing laboratories would be small and that there would be increased mobility between European countries.

One of the EMBO members has given this preliminary view of the proposed laboratory's philosophy.

The new outlook on biology has emerged largely in consequence of our increased ability to investigate fine structure—macromolecular (protein and nucleic acid structures), topological (genetic material) and organizational (viruses, muscle, ribosomes). Many new techniques have contributed—x-ray diffraction, electron microscopy, spectroscopy, chemistry, fine-structure genetics. In consequence we can now discuss function in molecular terms, at least in principle. But in most areas, the new techniques have only been deployed in a fragmentary way; we know the structure of one kind of nucleic acid, of one or two proteins; the general principles of virus architecture have been elucidated; the broad outlines of parts of the genetic map of one or two organisms have been established. Today, the general character of biological organizations can be grasped; we begin to apprehend the total behavior of a simple organism such as *E. coli* in the broadest outline, with no details anywhere and with large areas of total ignorance (how do cells divide? how does the cell membrane work?). In principle, there seems no good reason why, by the application of techniques which are already in our hands, we should not achieve a virtually complete understanding of such an organism. But to do this will demand an exploitation of these techniques on a very large scale.

The laboratory is a much less definite proposition at the moment than the European molecular biology fund. Some people argue that the laboratory should be placed in a region where molecular biology needs strengthening. Others argue that the laboratory should build on strong groups, such as those in Cambridge and Paris, especially since the boundaries of molecular biology are still flexible and may embrace new disciplines only to be found in large intellectual centers. But the need for "extra-territorial" privileges for such a laboratory's staff may restrict the choice to Geneva, where CERN has issued a welcome, or Brussels, where land has been made available on the battlefield of Waterloo through another project—a proposed International Life Sciences Institute sponsored by Princess Liliane, the wife of former King Leopold III, which will probably join forces with EMBO.

With the support of many of Europe's leading biologists, friendly support from CERN, expressions of interest from European foundations, and the probable backing of the Belgian project, EMBO looks like the most successful of the international efforts to strengthen biology in Europe. If EMBO is successful it will be building on sharply reinforced national support for biology. European biologists are acting with a new independence.

—VICTOR K. MCELHENY