

UNIDO Hopes for Biotechnology Center

Plans to help Third World nations develop expertise in biotechnology are hindered by argument over site for proposed center

Madrid. Ambitious plans to create an international center for research and training in biotechnology directed specifically to the needs of the Third World are floundering due to inadequate support from developed nations, disagreement among developing countries over the criteria for choosing a site and the failure of the United Nations agency which has proposed the idea—the United Nations Industrial Development Organization (UNIDO)—to come up with an acceptable compromise.

At a meeting in Madrid 2 weeks ago, hosted by the government of Spain, ministerial level delegates from 25 countries signed a set of statutes defining the legal structure of the center and how it would, in principle, operate.

The meeting failed, however, in its main function—deciding where the center should be based. Eight countries—Belgium, Bulgaria, India, Italy, Pakistan, Spain, Thailand, and Tunisia—want to be host. Yet disagreements have grown between those who argue that the site should be chosen primarily on the basis of its attractiveness to scientists expected to work there, and others who argue that broader aspects of development, such as the way that the center could help redress the current imbalance in scientific facilities between rich and poor nations, should be given equal priority. Failure to break this deadlock is now threatening the whole scheme.

Plans for the proposed center have been developed by UNIDO as part of its broad responsibilities to aid the industrial development of the Third World. "The applications of genetic engineering and biotechnology in vital fields such as health, energy or food are of major relevance to the developing countries," says UNIDO's executive director Abd-El Rahman Khane.

The need to counterbalance the current concentration of biotechnology research on the problems of industrialized countries was endorsed by a meeting of scientists—including several top U.S.-based molecular biologists who originally came from Third World Nations—held at UNIDO's headquarters in Vienna early in 1981. The meeting decided that the best way to meet this objective would be

to set up an independent research and training center, financed by contributions from both developed and developing countries. Proposed research topics might range from plant physiology to vaccine production.

"One might say that what Cold Spring Harbor is to basic molecular biology, the new center would be to applied molecular biology," says Ahmad Bukhari, a Pakistani who is now at Cold Spring Harbor.

Ananda Chakrabarty of the University of Illinois in Chicago is equally enthusiastic about the idea. He suggests that the center could help to persuade some fellow Third World scientists now working in laboratories in industrialized nations to return home. "Many of these scientists would go back if they knew that they had access to the same type of

Applications of genetic engineering called vital to developing nations

research environment as that in which they are currently working."

Bukhari and Chakrabarty were two members of a group of scientists, headed by Carl-Goran Beden of the Karolinska Institute in Stockholm, who visited national capitals throughout the world to sound out opinion about the creation of such a center. The other members of the group were Herbert Boyer of Genentech and the University of California at San Francisco, Saran Warang of Canada's National Research Council, and Ray Wu of Cornell University. They met with a mixed reaction.

Scientists and officials in developing nations were uniformly enthusiastic, as were people in those developed countries that felt they might be chosen as the host for what has become known as the International Center for Genetic Engineering and Biotechnology (ICGEB).

However, other advanced nations, particularly those already pursuing successful biotechnology programs, were

lukewarm. Little enthusiasm, for example, was found in France, Great Britain or West Germany, while Japanese government officials did not even agree to meet with the scientists.

The United States was—and has remained—similarly negative. While informing the scientists who visited the State Department and the Department of Commerce that the Administration was waiting to see how plans for the center evolved before deciding whether to make any firm commitment, U.S. officials apparently made it clear that they were unlikely to support an initiative which would not only mean funding a new U.N. project, but might also boost foreign competition in a field in which the United States is striving to maintain economic leadership.

A lack of enthusiasm for UNIDO's plans, for example, is illustrated in a draft report on biotechnology, prepared at the request of the Office of Science and Technology Policy (a report which has since been suppressed). It claims that the center's work program "could prove overly ambitious in light of the operating budget," and states that "the UNIDO center is unlikely to produce world class research."

Initial plans envision a center which would be staffed by about 50 scientists, 26 postdoctoral fellows, and 100 visiting trainees. Equipment costs were estimated at \$9.5 million, on top of the cost of land and buildings. The operational budget would be about \$35 million for the first 5 years. Both figures, UNIDO officials note, are equivalent to the sums a large chemical company might invest in a single U.S. university.

The generally positive reception that the proposal received from many Third World governments led two countries—Belgium and Canada—to submit detailed offers to host the center; in each case, the country offered to provide a substantial proportion of the initial costs (Canada later withdrew its offer due to internal political and economic problems).

At an important meeting in Belgrade, Yugoslavia, however, the scheme, which up to then had been largely formulated by scientists and U.N. officials, became thrust into the mainstream of

broader debates about development strategy. This was encouraged particularly by developing country representatives who claimed there was a need to mount a direct challenge to the activities of the United States and other advanced industrialized nations keen to reap maximum economic advantage from their scientific leadership.

The countries gathered at Belgrade therefore agreed that to meet both scientific and development objectives simultaneously, "it is most desirable to set up such a center in a developing country." Several of those present, namely Cuba, Thailand, Pakistan, and India, asked to be considered as potential hosts.

But others felt strongly that choosing a developing country could make it more difficult to attract the staff needed for a center of research excellence. "The center will not be able to function effectively if it is located in an area which is remote from the scientific constituency on which it depends," says Lennart Phillipson, director general of the European Molecular Biology Laboratory in Heidelberg, Germany.

Unable to agree on a single site, the 35 countries represented at Belgrade set up a committee to visit and evaluate each of the proposed locations. "The question in our minds was whether it was possible for good, high-quality science to be done in the circumstances that we saw in each of the countries," says the committee's chairman David McConnell of Trinity College, Dublin.

In its report completed in May of this year, the committee gave its seal of approval to three out of the six proposed candidates: Belgium, where the regional governments of Brussels and Flanders are proposing a site on the capital's perimeter sharing facilities with the Free University of Brussels; Italy, which is offering to build the center in Trieste, close to the International Center for Theoretical Physics; and Thailand, which has put forward plans to create the center on a university campus just outside of Bangkok.

The committee's report was intended to simplify the final site selection, which was to have been made at the Madrid meeting this month. In practice, it had the opposite effect. India in particular has mounted a vigorous bid for the center, using a wide range of formal and informal diplomatic channels with the personal backing of Prime Minister Indira Gandhi.

Indian officials contest the committee's conclusion that the New Delhi area, where it is proposing the center be

Biotechnology Network Planned

Paris. As delegates from the developing nations were agreeing to disagree in Madrid on where to site a proposed International Center for Genetic Engineering and Biotechnology (see accompanying story), their counterparts from the developed nations were already preparing to put into practice a different scheme for helping to bring biotechnology to the Third World.

France and Great Britain have taken the lead in creating an International Technology Network, aimed at encouraging greater cooperation in postgraduate training and fundamental research in biotechnology to meet the needs of developed and developing nations alike. Japan, Canada, and Italy have agreed to support the proposed network, which for the first 3 years will be coordinated by a small secretariat based in Paris and paid for by the French government. The United States, West Germany, and the Commission of the European Economic Community (EEC) in Brussels are currently attending steering committee meetings as observers.

The network was initially proposed by a working group established by the 1982 economic summit at Versailles to look at ways of encouraging greater cooperation in science and technology by the advanced industrialized nations. Although the United States expressed reservations, arguing that any form of intergovernmental collaboration in biotechnology research could interfere with market forces, the proposal was one of 18 endorsed by the heads of state meeting in Williamsburg, Virginia, in May (*Science*, 17 June, p. 1252).

The network was officially inaugurated in Paris by the French Minister for Industry and Research, Laurent Fabius, at a meeting at the Pasteur Institute on 5 September. Fabius, who is spearheading French support for greater integration of the science policies of the member countries of the EEC, claimed that the network will be an opportunity "to develop fruitful cooperation between industrialized countries, as well as between the countries of the North and the countries of the South."

As far as training is concerned, the network will use existing institutions to offer students from both developed and developing countries a course in two parts. The first 3 to 6 months will be spent on a basic training in technological principles; this will be followed by a 2-year program of research, part of which would be spent in the student's country of origin. Fellowships for such students, particularly from the Third World, would be sought from national and international agencies; discussions are already taking place with Unesco about significantly increasing that organization's postgraduate fellowship program and linking it to the network's activities.

Marc Chopplet, head of a group at the recently created Centre d'Etudes des Systèmes et des Technologiques Avancées which is providing the secretariat for the network, denies that there is necessarily any conflict with UNIDO's proposals for an international center. "Our philosophy is very close to UNIDO in recognizing the need of opening up the possibilities offered by biotechnology to the developing countries," says Chopplet.

In political terms, however, the two offer rival attractions. In contrast to the multilateralism of the UNIDO scheme, the network would build on existing bilateral links between individual developed and developing countries, would not involve creating any new institution or a large administrative structure, and would keep away from most areas of applied research. Significantly, both France and Great Britain were noticeable by their absence from the Madrid meeting to discuss the UNIDO scheme.

The United States is still waiting to decide whether to participate as a full member of the network's steering committee, which is being chaired in alternate years by France and Britain. Aware of U.S. concern about government support for research which could have short-term commercial applications, the steering committee has backed off an explicit proposal from the earlier working group that it should encourage the nations involved to work jointly towards the coordinated development of "orphan drugs" for diseases hitherto not amenable to pharmacotherapeutic control. Whether this will be sufficient to persuade the United States to join, particularly in the field of training, remains to be seen.—D.D.

built, lacks an adequate existing scientific infrastructure to support it. They claim that some of the criteria used to judge the sites, such as international communications, had been applied to the disadvantage of developing country locations, and have accused the committee of placing more weight on social factors sought by highly-paid scientists, such as climate and recreational opportunities, than on the social and economic needs of the host country.

Soon after the opening of the Madrid meeting, it became clear that the Indian delegation intended to fight tenaciously for the center. Anticipating a tough battle, several of the other candidates announced substantial increases in their offers of financial aid. Italy, for example, which had a 19-member delegation in Madrid, headed by the Minister of Science and Technology, Luigi Granelli, announced that its initial \$19.5 million offer (previously matched by an almost equal offer from Belgium) had been increased by a further \$28.5 million from its foreign aid budget, half of which was to support the activities of affiliated cen-

ters in both developed and Third World nations. And Spain, which was hosting the meeting, offered a \$15 million interest-free loan in addition to the money it had already proposed to cover initial costs.

It soon became clear however, that the final selection of the site was not going to be made on scientific, technical, or financial grounds alone. It was rapidly becoming a test of political muscle—particularly between Thailand, which the site visit committee had previously identified as the only developing country candidate offering a sufficient scientific infrastructure and India who, with the support of several other developing nations present, continued to argue that the committee's conclusions were wrong and that the decision should be made on broader grounds.

A special negotiating group was set up to identify one location which it felt was "feasible and acceptable" but announced after 3 days of discussion that it had been unable to reach a conclusion.

It was agreed that the siting decision would be postponed yet again and that

another committee would meet at the UNIDO headquarters in Vienna to try to come up with a solution over the next 4 months.

UNIDO officials are putting a brave face on the meeting's failure to reach an agreement on the site. "We are victims of executive enthusiasm," says executive director Khane, pointing out that, if nothing else, discussions about the proposed center have helped draw the attention of Third World nations to "the importance of this emerging field of science and technology."

Plans for the center are far from dead, even though the longer it takes to reach consensus, the more difficult it could prove to raise adequate financial support, particularly because funding is currently planned to be based on voluntary, rather than assessed, contributions from member states. But some inspired act of diplomacy could still break the deadlock and produce a rabbit out of the hat, even if its final shape is considerably different from that envisaged by the scientists who first met in Vienna two and a half years ago.—**DAVID DICKSON**

The Commercialization of Space

Suddenly there is a lot of interest in high-tech development in orbit; NASA and the White House are working hard to encourage it

Nearly two decades after the launch of the first communications satellite, the business and financial communities seem poised for a new wave of commercial expansion into space. Mindful of the recent booms in computers and biotechnology, investors are paying close attention to endeavors such as remote sensing, private launch services, and zero-gravity materials processing. In some cases people have begun to risk serious money—McDonnell Douglas and Johnson & Johnson have already put several tens of millions of dollars into experiments on purifying pharmaceuticals in the zero-gravity environment of the space shuttle—and high-level policymakers in Washington, eager to promote high technology in any form, are working hard to find ways to encourage them.

Several trends have been converging in recent months:

- In keeping with his Administration's sympathy for private enterprise, Ronald Reagan promised in his space policy message of 4 July 1982 to "provide a climate conducive to expanded private

sector investment . . . in civil space activities." He underscored that commitment on 16 May of this year by directing NASA to transfer its expendable launch vehicles, the Delta and Atlas-Centaur rockets, to operators in the private sector. (NASA had planned to phase them out anyway in favor of the shuttle.)

The Reagan Administration is also continuing its efforts to transfer the weather satellites and landsats to the private sector (*Science*, 12 August, p. 632). Meanwhile, the White House's top-level Senior Interagency Group on Space is drawing up a "National Space Agenda" for release some time this fall. The section on commercialization is being written by Craig L. Fuller, assistant to the President for Cabinet Affairs. On 3 August Fuller brought in 12 corporate managers to discuss space commercialization with the President. Among other things the businessmen stressed the desirability of some kind of national space station, both as a research center and as a potential factory site for space-based materials-processing industries. Reagan

promised nothing, of course, but by all reports he was fascinated and enthusiastic.

- NASA wants very much to build that space station and is actively courting the business community's support. In addition, some of the other things the agency would like to do seem ripe for joint ventures with private industry—for example, a reusable Orbital Transfer Vehicle that would ferry communications satellites from the space shuttle's 1100 kilometer maximum orbit to the 35,900 kilometer geosynchronous orbit. Thus, on 6 June NASA administrator James M. Beggs organized a Commercialization Task Force at agency headquarters. "There's been a big change in attitude on the part of industry," says task force head L. J. Evans. "In the past two months I've had about 200 people walk through my door asking what they can do in space—and the gratifying thing is, they're from all over, not just aerospace firms." By December his task force will report back on what kind of incentives and joint endeavor arrangements will