

FINAL WORD

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CONFLICTS PERVADE THIRD WORLD BIOTECH PROPOSAL

B iotechnology, perhaps more than any other area of advanced applied science, offers new solutions to the old problems which continue to hold many countries in the dark ages: disease, starvation, overpopulation, and the lack of low cost energy. Unfortunately, the benefits of biotechnology will remain primarily within the province of the economically advanced countries of the world unless a workable means is found to bring it to the developing nations.

In a creative attempt to resolve this dilemma, the United Nations Industrial Development Organization (UNIDO) has proposed the establishment of the International Centre for Genetic Engineering and Bio-Technology. A high-level meeting was held in Belgrade, 13-17 December, 1982, at which official representatives from 35 countries came to discuss both the concept and the details of the UNIDO proposal.

The smallest acceptable institution would consist of a staff of 168, including 50 scientists and 26 postdoctoral fellows; would entail capital costs of \$9.5 million (exclusive of buildings, to be provided by the host country); and operating costs of \$8.6 million per year. Yet the Work Programme includes the application of genetic engineering for energy and fertilizer production from biomass, hydrocarbon microbiology with regard to tertiary oil recovery, improved human and animal vaccines, particularly with regard to tropical diseases, and the improvement of food and agricultural products. In addition, the centre would address the special ways in which advanced biotechnology is to be adapted to developing countries and maintain a comprehensive information service (Bio-informatics) and computer facility. The Centre would also train 100 visiting scientists. This is an extraordinarily ambitious undertaking for an institution of the size and budget proposed. Even companies three times the size of the proposed center, such as Cetus and Genentech, can only do justice to a small number of projects.

It must also be kept in mind that biotechnology is much more than research. If research results are to be made useful for the solution of real problems, attention must be paid to the matters of scale-up, process development and economic efficiency, stability of genetically engineered strains, purity of products, and testing for the safety and efficacy of any substance for human use. Indeed, if the Centre is to train individuals in all aspects of biotechnology, then all of these elements must be included in the Centre's activities.

Had UNIDO consulted the vast reservoir of experience which exists in the commercial biotechnology industry, the Centre's architects could have come up with a more realistic (and expensive) proposal. Even so, the Belgrade meeting was an ideal opportunity to examine and refine the proposal. But the delegates had little experience to help them critically examine the numbers. The scientists present were unable to alter the perception of many that

Burke Zimmerman, Ph.D., was an observer at The United Nations Industrial Development Organization (UNIDO) conference which considered the organization of an international biotechnology center.

the International Centre could be all things to all countries.

While such attitudes made dealing with the hard realities of establishing the Centre difficult enough, the matter had begun to slide into the murky domain of politics, U.N.-style, even before the meeting began. It was expected that the leading industrialized nations would be represented and take an active part in the discussions. But Japan was nowhere to be found. The United Kingdom decided at the last minute to send an observer. And the United States, after a bit of vacillation, chose not only to stay officially away but forbade its designated delegate, who was in Paris immediately before the meeting, to attend even as an observer. The same orders were given to the U.S. Embassy in Belgrade.

Why did the United States choose to be so conspicuously absent? On the surface, the reason given is economics. No Federal agency was willing to contribute the expected tithe (around \$2 million). An interagency committee on technology transfer had expressed doubts that the Centre could succeed anyway, so why bother? But a boycott? Was it just bad diplomatic judgment? Or was there any connection between this action and the recent rumblings from the intelligence agencies about the sharing of scientific and technical information with scientists outside of the United States? The proponents are concerned that even non-classified good old American know-how will somehow aid and abet potential military and ideological adversaries as well as economic rivals, eroding the presumed American preeminence in science and technology. Participation in the Centre might then be seen as the donation of precious knowledge, and that, in the insecure eyes of some, is bad. In any case, the choice of the leading country in biotechnology to give the cold shoulder to the whole affair must be viewed as a diplomatic blunder. American esteem in Belgrade was not high to begin with; this move only made the United States look foolish.

The important issue of funding for the Centre was not even discussed at the meeting. Other touchy issues were deliberately left off the agenda, such as international patents and licensing. And the matter of how the Centre will deal with the private biotechnology industry, as it must, was avoided, as though the private sector didn't exist. This too, is a sensitive subject. Many fear that if the "multinationals" control biotechnology, the findings will be engulfed in secrecy and thus will be unavailable for the benefit of the world.

Is there hope, then, of establishing an international centre that can function and survive in the real world? The concept of the International Centre of Genetic Engineering and Biotechnology is a sound model for the "transfer" of this promising new technology to the parts of the world where it is needed most. Before the Center can succeed, however, UNIDO and the participating countries must make use of the valuable data concerning the establishment and activities of the existing commercial biotechnology industry. If, for political or other reasons, the experience of the private sector continues to be

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 ignored, many mistakes will be made. The information is there for the asking. The International Centre cannot afford to repeat the learning curve.

Then, the matter of funding must be addressed seriously, for that, ultimately will determine whether or not the International Centre is to be. It may be difficult to build and sustain the Centre solely from contributions from national governments. Why not also explore the possibility of at least partial corporate funding for the Centre? It could also enter into contracts and partnerships with private companies, either to fund or undertake work in needed areas.

The wealthy and developed industrial countries would, of course, help a great deal. But why should these countries care? Foreign aid has always been inspired by the "national interest" far more than altruism. But certainly, greater economic independence will make any nation less vulnerable to imperialism and internal corruption, and that is certainly in the best interests of the United States.

With the decisions on the International Centre still some distance in the future, there is still plenty of time for the United States to get involved. Its participation could do much to ensure the success of the Centre and, ultimately, to the world standard of living. Surely it is worth it.

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Each of these "finds" prompts ideas about means of making use of such bizarre abilities. A newly recognised thermophile, for example, could provide unusually stable, high catalytic activity enzymes for industrial use. And a virus which is a pathogen in one plant might easily transform the production of other, high-fibre crops. But again, it is the less apparent applications that could have the most far-reaching consequences. What counts is the principle. While the chemical industry plays molecular roulette on known themes, our planet's teeming microbial life remains largely ignored as the source of an infinite range of possibilities.

In their recent book *Extinction*, Paul and Anne Ehrlich give a telling analogy. As you are about to board an aeroplane, you notice a man removing rivets from its wings. He's taken out lots before without hazard, he assures you. But the thirtieth rivet gone from a wing flap could mean disaster. So too, the Ehrlichs argue, could the loss of any one plant or animal species that is pivotal to the complex web of life on earth. That message was directed at the conservation and ecological instincts of their readers. It could just as easily be aimed at biotechnologists—whether seeking understanding, or profit, or both.

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