

BIOTECHNOLOGY

FIVE INDUSTRIAL IMPERATIVES

Readers may benefit themselves and their fields if they consider several imperatives for US biotechnology over the coming year.

- Environmental concerns, particularly issues regarding the microbial fitness of future products and known, wild-type pathogens, should be elevated to become strong industrial priorities. There are several excellent reasons for corporations and government agencies to increase research support on microbial fitness. Since it is the cornerstone of successful use of genetically engineered organisms in the environment, a more definitive knowledge about environmental fitness will lead to a greater understanding of potential dangers of products released into the environment, answering questions posed by regulatory personnel earlier on in the R&D process. A sound knowledge of environmental fitness will lead to new, commercially promising technologies for debilitating pathogens or replacing pathogens with competitors that have been debilitated. Development of a better understanding of environmental fitness can also be used in the continuing attempt by industry to lobby for public acceptance of biotechnology products. Industry all too frequently associates ecological concerns with high costs. It is hoped that corporations will start to show greater recognition that ecological analysis is a path to greater profitability. An expansion of exploratory research in these areas will benefit all parties.

- The opportunity for biotechnology to contribute to balanced international economic growth needs to be explored and orchestrated within a macroeconomic perspective. Since it is in the best long-term interests of the economies of developed countries for developing countries to share in the division of effort in commercializing biotechnology, a mechanism should emerge to coordinate these national interests.

Although this proposal for coordination can improve the welfare of nations, there are no illusions that it will be pursued. The great obstacle is the inability or unwillingness of governments to plan for long-term growth when the leaders of their economies refuse to sacrifice short-term growth. Nevertheless, the possibility needs to be discussed, even if it simply serves to illustrate how governments fail to serve their own national economic interests.

Specific attempts should be made to minimize the duplication of technology development and encourage the development of complementary technologies. Failure of governments to plan together or at least keep each other fully informed will undoubtedly lead to conflicts over price regulation, import quotas, discriminatory regulatory policies, and the many other ugly aspects of international competition.

- President Reagan should appoint at a cabinet level a technology adviser who would be granted far greater authority than the current science adviser to the President. The President's science adviser and his Office of Science and Technology Policy (OSTP) are limited to informing the public about the President's policies. There is a crying need, above and beyond the debate over industrial policy, for an adviser who can translate scientific progress and technological potential into economic terms for the President and help shape governmental policy for the future.

- U.S. business and scientific leaders in biotechnology should be sharply critical of Reagan's 1985 budget proposals. Their projected deficits and lack of substantial increases for non-military technology development may damage the growth of U.S. biotechnology.

When Reagan took office he inherited a \$60 billion budget deficit. While he continues to stump for a Constitutional amendment to balance the budget, the President is lobbying for a budget that would yield a deficit in 1989 running between \$128.2 and \$325 billion, depending upon whether the Reagan administration or the Congressional Budget Office estimates prove to be correct. To paraphrase the President's chief economic adviser, the link between huge deficits and high interest rates is simply a fundamental tenet of modern economics. The eventual losers could be corporations that will be forced to compete with the government for a limited money supply at exaggerated interest rates. Although money currently banked for investment in scheduled projects will grow with higher interest rates, it will be more difficult and more expensive to raise new money for research or clinical trials. The temporary economic recovery that signalled Wall Street's new love affair with biotech last year could be washed away after Reagan is safely re-elected. Reagan's proposed 1985 budget also threatens to downgrade direct government support for applied research in new technologies. While spending on military technology will rise sharply if the proposals are accepted by Congress, the overall increase of 1.6 percent in spending for R&D with civilian application will trail the projected inflation rate of 4.7 percent.

It is time to admit that the term "biotechnology" has become too much of a catch-all. To the extent that biotechnology is still a glamorous topic among politicians, business planners, and Wall Street executives, it feeds a tendency to develop technology purely for its own sake instead of meeting the needs of the marketplace. The onus is on industry executives and scientists to shatter the myth of industrial unity surrounding biotechnology. Failure to do so will result in millions of dollars thrown at technologies with little or no commercial value.

—Christopher G. Edwards